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Full name and details of corresponding author:

Name: John Pendlebury

Academic Title: PhD

Current Position: Professor of Urban Conservation

Affiliation: School of Architecture, Planning and Landscape

Post address: The Quadrangle, Newcastle University, Newcastle upon Tyne NE17RU

E-mail: john.pendlebury@newcastle.ac.uk

Telephone: +44 (0) 191 208 6810

Co-authors
Name: Neveen Hamza

Academic Title: PhD

Current Position: Senior Lecturer

Name: Adam Sharr

Academic Title: PhD

Current Position: Professor of Architecture

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Conservation Values, Conservation-Planning and Climate Change

Abstract

The desire to reduce carbon emissions and the desire to sustain historic buildings and environments are two significant contemporary policy objectives which potentially are not easy to reconcile. It is through local governance and policy systems that much of the mediation between these will take place and, in the UK, through the conservation-planning system. This paper focuses first upon the relation between conservation values and the powerful agenda of carbon-reduction and the way that decision-making is mediated through systems of regulation, such as planning control, through a number of brief case studies. The paper then goes on to argue the need to explore how these two forces might positively interact in new ways through the case study of proposed works to Hexham Abbey in northern England.

Introduction

It is increasingly standard practice in both academe and practice to conceive of conservation and heritage management as values-based activities and to focus on ideas about what is significant about a building or place that makes it something we should seek to protect. In other words, what is special? Why conserve? In turn it is now commonplace to recognise that such concepts of variable cultural, historical, or social value are culturally and historically constructed. Value found in a particular fabric, object or environment is not, here, an intrinsic quality. Instead, that fabric, object or environment is a participant in its own cultural construction; it acts as the bearer of cultural and historical meanings which are projected onto it by individuals and groups in society at different times. It attracts a value status depending on the dominant frameworks of value of the time and place where it is being valued (see e.g. Gibson and Pendlebury, 2009). Whilst it is not the direct focus of this paper, we should, therefore, have in mind the significance of power relations in creating, privileging, sustaining and transmitting particular heritage values and heritage practices and the way this can close-down other possible approaches to heritage (see, for example Smith, 2006).

The 'fact' of 'man-made' climate change has become broadly accepted and does not need to be rehearsed at length here. Whilst the precise extent of climate change that will follow from the carbon-burning activities of the industrial world are contested and uncertain, few now argue that they will not be significant and that this heralds an environmental crisis of the utmost gravity (see, for example, IPCC, 2013). In this context it is clear that conservation practice will increasingly be influenced by responses to the low carbon imperative. However, whilst the scientific case for climate change might be clear, responses to this, such as carbon control, involve a range of mechanisms, whether technical, policy-based, or premised on social change that are, in part at least, value-based.

Literature in the UK on the interrelationship between heritage protection and climate change has been largely practice-focused and it has had a strong emphasis on the impact that a changing climate might have upon material heritage, such as English Heritage's statement on climate change (English Heritage, 2008a). Less common has been writing on the contribution of energy consumption in the historic environment to carbon consumption, and the ways in which this might be mitigated, although this is gradually becoming more

evident. Thus, for example, the more recent statement by Historic Scotland (undated) on climate change includes actions upon, for example, energy efficiency in traditional buildings whilst still foregrounding threats to material heritage. Thus we might say the primary focus has been on issues of *adaption* rather than the role of heritage in *mitigation* (Davoudi et. al. 2009).

Our concern and contribution in this paper is to focus upon how systems of heritage value might respond to the carbon control agenda. After first setting out some background on heritage values and briefly describing some of the complexities of carbon control (including issues of value) we discuss how the systems of heritage protection and carbon control interact and are mediated in the British context. After briefly outlining the different possible ways interaction *might* occur our focus shifts to practice in the policy-framed but discretionary arena of the planning system. Within the brief examples we give we can see a variety of outcomes – attempts to balance heritage protection and carbon control and situations where either heritage or carbon values have been asserted as of primary importance. In the final part of the paper, we explore a different approach – a potential evolution of heritage value - through a case study of Hexham Abbey in northern England.

The values of heritage protection

The practice of conservation-planning has it roots in architectural conservation. The origins of 'modern architectural conservation' in Britain are linked to two nineteenth century polymaths, John Ruskin and William Morris, famous in this context for opposing the speculative restoration of ecclesiastical buildings through radical interventions in building fabric (Jokilehto, 1999). A critical precept for Ruskin and Morris was that the value of the building, its authenticity, is closely associated with its material fabric. The goal of the architect or conservator should be to make as little physical alteration to the historic building as possible. Ruskin's ideas were mobilised and codified by the Manifesto drafted by Morris in 1877 at the formation of the Society of the Protection of Ancient Buildings (SPAB) (Morris, 1877). This remains a touchstone document within the field of architectural conservation. Thus Ruskin and Morris articulated principles of conservation action, of how buildings should be treated, such as minimum intervention, that are still current.

Subsequently, the material content, or the 'what', of architectural conservation has undergone an extraordinary transformation. Definitions of objects, places and environments that are ascribed with heritage value have extended to encompass a huge diversity of buildings and locations in terms of architectural style, associations with high and low culture and temporal period. And the conservation project also developed in other ways – most notably the increasing focus from the mid-twentieth century to look beyond the monumental to historic places and the subsequent creation of a system of conservation areas. In the process, key principles of intervention have endured, albeit within a shifting framework. So, for example, there is now greater tolerance towards physical interventions where these can be considered reversible (for example, see the now superseded British Standards Institution, 1998). A greater emphasis on aesthetic considerations has also developed. The extension of the mission of conservation from object to place, and the management of place, reinforced the picturesque, compositional element of conservation, for example, through the influence of the townscape movement (Larkham, 2003; Pendlebury, 2009). Thus, while architectural conservation as an activity has been extended over a larger quantity of buildings and places over time, its value framework has evolved and

part of the domain of architectural conservation has been increasingly linked into systems and processes of town planning, acquiring values and tropes from planning.

Thus, in broad terms, architectural conservation and conservation-planning have developed around dominant values which put an emphasis on the preservation of fabric, which we might consider a foundational value, and a more recent emphasis on aesthetics and visual appearance. We would suggest that, in the management of listed buildings, both these values tend to be significant but, in the stewardship of conservation areas, management goals often emphasise a particular idea of how a place should look (Pendlebury, 1999). As the twentieth century progressed, the prevailing aesthetic became increasingly antagonistic to the visual expression of the symbols of modern life. Whereas historically new technologies might be emphasised visually, such as red telephone boxes (a technology almost redundant, but which in some places is now protected as heritage), there seems to have been an increasing desire for technologies to be hidden or visually suppressed in the streetscene. Houses, however old their construction, have been retrofitted with building services – water, sewerage, electricity, central heating, broadband and so on – providing a new domestic infrastructure and fundamentally changing the way we live. But whereas these technologies are usually visually apparent in interior spaces, and might be celebrated in areas such as kitchens and bathrooms, there has very often been a broad consensus in the planning and conservation professions and society in general that their external visual impact should be minimised.

So heritage protection values are defined by a history in architectural conservation, its mythology and organising ideas that, whilst not immutable, is stable and reinforced by canonical texts that code and solidify the identity of the practice and its norms. But changes do occur in terms of how, why and what buildings should be conserved, and these changes occur at differential speeds, with each dimension having a different pace of change and ability to be normalised. So, whilst an emphasis on the authenticity of fabric is an extremely stable value, other values may change more rapidly.

Reducing carbon consumption

Over the last decade, the issue of carbon control has gradually moved to the centre of the environmental policy stage and has for some writers challenged sustainable development as the organising principle of socio-environmental regulation (While et. al. 2010). At the same time achieving effective action in terms of reducing carbon emissions is complex and contested. Ralf Brand and Jan Fischer (2013) examine this in terms of a dichotomy between technophilia and technophobia. In summary, technophilics see the solution to the problem of carbon control occurring through technical ‘fixes’, whereas technosceptics emphasise changes in behaviour over technological remedies.

Extending this dichotomy to the existing building stock, it is very often considered that the reduction of carbon emissions requires technologies for intervention, either to save energy (e.g. insulation) or to create energy (e.g. micro-renewables). However, at the same time, the evidence would suggest that thermal comfort expectations are rising. Average UK indoor winter temperatures have increased from 13°c in the early 1970s to about 17.5°c in 2006, which might reflect an increased preference for warmer homes and hence reflect changed comfort requirements (Shorrock and Utley, 2008), so one potential response to reducing carbon consumption - reverting to the chillier temperatures which most buildings would have maintained historically – seems very much off the political and social agenda in most

circumstances. Rather, in the British context at least, the individual householder is exhorted to reduce their carbon consumption on a mixture of fiscal and moral grounds. So, for example, rapidly rising energy costs and government incentives supporting micro-generation infuse an economic rationality to reducing carbon, but wrapped in a wider moral discourse about environmental responsibility and frugality. However, the evidence suggests that improved efficiency tends to lead to higher demand as consumers become less price sensitive (see e.g. Herring and Roy 2007, Steg 2008).

Thus reducing carbon consumption is a complex affair and achieving it will require understanding of complex and social practices, a source of frustration for policy-makers who rather simplistically may see it in terms of a 'value-action' gap (Shove, 2010). Implementation models founded solely on principles of new technology and human rationality seemed doomed to failure; in the words of Brand and Fischer,

> … values always creep in through the back door. Even if we all had determined what is rationally best according to our individual framework, we would still struggle to overcome our established routines, to deviate from the norm-behaviours built into infrastructures around us, and to resist unsustainable economic signals. (Brand and Fischer, 2013: 242).

Thus, whilst human-made climate change might be an observable fact, what to do about it is as much a socially constructed arena as heritage protection.

Mediating and balancing values

One of the principal ways that the twin social objectives of heritage protection and carbon control are articulated is through state legislation and policy, at different governance scales. In Britain, decisions over changes to buildings that may change the balance between heritage protection and energy consumption are addressed in two principal arenas, first, through town planning and development management and second through building regulation. The emphasis in the planning system is principally around policy considerations but whereby discretion in policy interpretation is left with officials, including the scope to ignore or override policy in the interests of 'good decision-making' (Pendlebury, 2014). Building regulations follow a more technical, standards-based approach towards building performance on various measures, with a substantial emphasis on energy efficiency in recent years. These two systems are not formally linked and it is quite possible to have consent approved for a proposal through one system but denied through the other (for example, introducing double glazing into a historic building might gain building regulation approval but not listed building consent in the planning system). In this paper our concern is with planning issues, although as Yvonne Rydin (2012) has pointed out, the emphasis on energy efficiency as a planning goal has prompted some convergence between the two systems in recent years.

In practical terms the focus in contemporary practice largely accepts the need to control carbon and be more energy efficient and the question arises about how this imperative interacts with heritage values? Which changes to historic buildings and historic environments are acceptable, and which are not, in addressing the climate change agenda? There are multiple possible outcomes to such debates. For example, it maybe the case that the goals of either sustaining cultural value or carbon control simply prevail over each other. But there are a range of more nuanced and complex possibilities. For example, physical

interventions considered reversible may be considered more acceptable than those that are not. A view that better and less intrusive technologies to achieve carbon control are on the horizon may mean that decisions are deferred. There may be a range of ways in which carbon consumption can be reduced and some stakeholders may prefer approaches which involve behavioural change of building users rather than physical intervention. Conversely, as we shall come on to, some may prefer the symbolism of a visible intervention.

However, all these approaches assume a largely static set of values. Our interest in this paper is to explore specifically how heritage values could potentially change and evolve in response to the carbon imperative. Paul Selman argued in 'Learning to Love the Landscapes of Carbon-Neutrality' (2010) that, whilst landscape changes often provoke controversy, they may produce outcomes which become accepted and valued after a period of time. The pursuit of a low-carbon economy is producing landscape change with such protest and opposition. But he goes on to discuss 'the notion of the 'acquired aesthetic', which might suggest the capacity to develop a taste for emerging landscapes if we endorse their underlying story' (p. 157). He raises the possibility that 'we can learn to see beauty and attractiveness in emerging landscapes of carbon neutrality' (p. 157). In our case study of Hexham below we mobilise similar ideas about how values can potentially evolve and change. First though we consider how the interaction of heritage values and carbon control are playing out in a variety of circumstances.

Policy, guidance and research: heritage values asserted?

Planning decision-making takes place within the framework of policy guidance at national and local levels. The current UK coalition government has sought to simplify and consolidate planning guidance around one brief central National Planning Policy Framework document (Department for Communities and Local Government, 2012). As might be expected in these recessionary times, there is a strong emphasis on economic competiveness in the document, albeit framed as 'sustainable development'. Within this over-arching framework there is substantial acknowledgement of both issues of climate change and the importance of heritage protection. However, as is typical (and perhaps inevitable) with planning policy, there is little indication of how to balance or reconcile these potentially competing priorities where they may conflict, leaving to the individual decision-maker the job of reconciling these different policies on a case-by-case basis.

This is mirrored at the local level in Britain. The conservation-planning system is in large-part based in local planning regimes led by local authorities. Increasingly, it seems, the management of carbon emissions is also becoming focused upon by, and becoming a focus for, local governance (Jonas et. al. 2011). A challenge for local governance, therefore, will be to reconcile the competing agendas of heritage management and carbon control alongside many other policy goals such as economic well-being.

A good illustration is offered by the policy frameworks of one historic city, York. There are many relevant York policy documents, including the city's design-based economic vision, a climate change action plan and the emerging Local Development Framework where policy objectives are gathered together (Simpson et. al., 2010, City of York Council, 2011 and Sustainable City York and Without Walls Partnership, 2011). We found, not surprisingly, that issues of heritage protection and management and issues of carbon control were both identified as being of the utmost importance but that, mostly, they sit discretely within the various policy arenas, with little sense of how they might interact. This is likely to be a

consequence of practicality – typically such documents are dealing with a wide range of policy objectives making a complex matrix of intersecting relationships – and, more systemically, a consequence of the difficulties of integrated-place management, cutting across service delivery silos (Healey, 2010). Occasionally, some cross-reference occurs; so, for example, policy in the Climate Change Action Plan, on making the city's existing housing stock more energy efficient through such measures as loft and cavity wall insulation, adds 'including, where viable, historic homes'. However, perhaps more typical is the strategic objectives identified in the Local Development Framework (the statutory development plan) for York City Centre where sustainability goals are described in relation to new development.

How to mitigate carbon consumption in a heritage context has been the subject of a variety of guidance notes, often aimed at householders and largely produced by heritage agencies, and research reports. For example, English Heritage has produced a range of such material (for example, English Heritage 2008b, 2008c). Generally these are sympathetic to the goal of reducing carbon consumption as long as heritage protection objectives are not compromised. In this context an interesting example of the type is *Warmer Bath: A guide to improving the energy efficiency of traditional homes in the city of Bath* (Bath Preservation Trust and the Centre for Sustainable Energy, 2011). As well as guidance for the homeowner it includes, more unusually, a survey of Bath residents' attitudes towards improving energy efficiency in traditional dwellings. There was seemingly a clear view from the majority of respondents that conservation policy should be more tolerant of measures to improve energy efficiency than is normally the case. So, for example, a majority or residents supported the introduction of secondary glazing and the use of timber slim-profile double glazing even if there was some impact on historic fabric. One third of respondents supported the introduction of solar panels even if there was some visual impact.

Research reports are, again, mostly focused at the individual building scale. An interesting example is a report on the retrofitting of an Edinburgh tenement with double glazing that found little concurrence between different cultural heritage professionals over which system was visually best (Changeworks, 2010). More unusual is research that looks at a wider spatial scale, such as *Retrofitting Soho* undertaken for the Soho area of central London by researchers at The Max Lock Centre (2008), University of Westminster, and commissioned by Westminster City Council, the Soho Community Environment Fund, the Crown Estate, English Heritage and Shaftesbury PLC. Soho was selected as a dense, heterogeneous historic city core and the report looks in some depth at the practicalities and barriers to reducing local carbon emissions and improving the efficient use of resources more generally. The report concludes, first, that there is significant potential for retrofitting in the Soho area and, second, that the challenges to retrofitting such historic areas are not as big as might be supposed. It argues that existing buildings are mostly pretty adaptable, with extensive areas of roof that are not visible, and that there is plenty of potential for internal upgrades to improve energy efficiency. The third and fourth main conclusions suggest that the main challenge is encouraging building occupants to behave in more energy conscious ways, noting that sufficient incentives do not exist for landlords to engage in this process, and that the greatest benefits could be achieved through community-wide solutions such as Combined Heat and Power.

Most of these key findings would apply to any dense, mixed-use commercial area but two of the key findings are specifically concerned with the historic nature of the neighbourhood: 'many buildings are not listed or of historic merit, and the rear of non-listed buildings can be adapted', and, 'an integrated approach to retrofitting is essential and one that works with the intrinsic characteristics of historic buildings'. We can see with these statements both a

differentiation of approach between properties judged by their defined heritage merit – listed, non-listed historic, non-historic – and assumptions about the implications in any retrofit projects. Following the discussion above, listed buildings are considered to have significant fabric and aesthetic qualities, whereas for the conservation area as a whole the concern is for selective visual management where, for example, the fronts of buildings are prioritised and the backs are considered suitable for redevelopment. Thus it is notable that the two key value systems at the heart of this report, carbon control and heritage protection, are accepted on their own terms. Whilst the report often emphasises how heritage designation does not present a constraint, where conservation and sustainability are seen in potential conflict – for example with listed buildings or street facades – heritage protection goals are considered to have more weight and to take precedence.

Asserting Carbon Values

The examples we gave above of policy frameworks, guidance notes and research studies seek to balance heritage protection and carbon control goals. Generally there is a leaning towards conservation objectives where the two aims may come into conflict, although the resident respondents in the Bath report challenged whether this should be the case. Indeed, that values of carbon control might be asserted over heritage protection has been an ongoing anxiety within the heritage sector that has long sought to position the protection of the historic environment as inherently sustainable (see, for example, Powter and Ross, 2005). A particular cause for concern in the UK has been the Government's 'Green Deal', a national programme aimed at incentivising homeowners to make houses more energy efficient, and the impact that consequent building works might have on the fabric, technical performance and cultural value of traditional dwellings, especially where they have no explicitly identified heritage designation. Gloomy forecasts have been made of a scenario where listed buildings and conservation areas stand as islands of visible natural walling materials, while the rest of the country becomes swaddled in external insulation (Preston, 2013). Such concerns have led, for example, to the Sustainable Traditional Buildings Alliance (STBA), an organisation whose affiliates include many of the leading conservation bodies, to undertake a report for the Department for Energy and Climate Change (DECC) on 'responsible retrofit' (STBA, 2012). Its major focus is upon how ill-considered retrofit of, for example, increased insulation or air tightness, can misunderstand how traditional buildings work as an energy system and can consequently damage historic fabric (directly and indirectly) and cause new problems, such as condensation. In a similar vein the Society for the Protection of Ancient Buildings has produced a briefing note on energy efficiency in old buildings (SPAB, 2014) that, for example, seeks to demonstrate how traditional buildings may have a much better thermal performance than conventional models predict. These documents are part of a response to what the heritage sector can perceive as a sustainability juggernaut, with the imperative for carbon reduction leading to ill-advised and damaging retrofit measures.

However, in practical terms, the balance between heritage protection and the carbon agenda is being played out through a myriad of individual planning decisions, usually made by local planning authorities. Battles might be fought, for example, between property owners and local authorities over reducing energy consumption through replacing timber single glazing with double-glazing in timber or PVCu. Equally, the introduction of micro-generation, such as the addition of photovoltaic panels to buildings, can be the cause of conflict. Two brief examples from designated conservation areas in the north-east of England illustrate the particular point. In both cases, photovoltaics were introduced without

planning permission and an application was subsequently considered necessary; in one case on the roof of a relatively newly built house at the edge of the small Northumberland village of Netherwitton (figure 1) and in the other on the elevation of a nineteenth century building in the much harder urban context of Blaydon in Gateshead. There are some similarities between the case studies and, in particular, how the planning cases proceeded (the Netherwitton case in 2010 and the Gateshead case in 2007). In both cases the officer recommendation was for the refusal of planning permission, purely on the perceived impact on conservation area character. Both officer reports made reference to a range of specific policies embedded in national and local policy documents (these cases precede the National Planning Policy Framework) including the then extant national policies Planning Policy Statement (PPS) 1 Delivering Sustainable Development, PPS22 Renewable Energy and Planning Policy Guidance (PPG) 15 Planning and the Historic Environment/ PPS5 Planning for the Historic Environment. Not surprisingly, the negative impact perceived was primarily visual with the reports making statements that the panels 'would cause harm to the visual amenity of the established streetscene' and that they were 'incongruous and out of keeping'. Embedded here are the values referred to earlier. This is a visual emphasis on keeping conservation areas free of too many visual indicators of modern life, even, in one of these cases, on a fairly new building.

However, in both cases, elected councillors rejected the advice of their officers and granted planning permission. At the heart of this different conclusion there seemed to be a view that if there was a clash of values then the sustainability drive to reduce carbon emissions should prevail. If there was a negative impact on the character of the conservation area this was felt to be very minor – although the carbon reduction impact of a few photovoltaic cells could equally be argued to be minor. However, it is noticeable that some actors in these cases did not recognise that harm might be done to the character of the conservation area. This was perhaps clearest in the Netherwitton case, where the application attracted five letters of neighbour support which generally contested the idea that the proposal would result in any negative visual impact and, indeed, argued the PV cells would be a positive symbol.

The issues presented in these examples are, presumably, being replicated around the UK, although not necessarily always with the same outcome. We see established conservation values with their particular visual reading of the built environment coming into conflict with the emergent values and symbolism of carbon control. And we would like to emphasise the symbolic content – a serious analysis of how best to reduce carbon emissions in either of these locations would be unlikely to propose a few photovoltaic panels – but they are a visual symbol of the householder's green credentials and that they are 'doing something'.

Evolving Values

In the latter part of the paper, we wish to consider attempts to reconcile heritage and carbon values through a discussion of decisions taken as part of our own work on the historic abbey church of Hexham. The brief for the report we prepared (with colleagues) for Hexham Abbey in the Tyne Valley, 20 miles west of Newcastle, was centred on how the Abbey might reduce its carbon footprint (Wilkins et. al. 2011). Whilst the study included some ancillary buildings, the main focus was upon the abbey church.

Our brief was to think strategically and to stimulate discussion rather than present a single approach. Our thinking was informed by some quantitative work which had been undertaken previously based on energy bills. We were asked to think about how the Abbey

might be made more sustainable and how any proposals might be achieved in relation to the ways that the building is used and the ways that the Abbey community engages more broadly with the people of Hexham. The second stage of the work was to undertake some consultation on our findings. One of the issues which was not always clear in the brief was whether the main motivation was to reduce energy bills, to reduce carbon emissions or *to be seen to be* reducing carbon emissions. This visibility of action, the symbolic potential of the church 'doing something' as a community leader, did seem to be an issue and, as we will touch upon, has implications for the sorts of strategy one might deploy.

For most of its history, Hexham Abbey was without heating or anything more than candles to light it at night. Today, however, it has a reasonably modern gas boiler powering a central heating system of pipes and radiators, largely at the perimeter of the abbey church, as well as electrical wiring for a host of uses. It was shown that over two thirds of the carbon emissions, and utility bills, are consumed with space heating so this became our main focus. The current objective is to sustain a constant temperature inside the church of 16^{o}C, both as a reasonable level of comfort for Abbey staff, worshippers and other visitors and, importantly, to keep the church organ in-tune. Possibilities for the future obviously have to be mindful for the architectural and historic importance of the building, but also of its use for religious observance. Another, more practical, factor we decided to consider was whether the focus should be to heat the church through a long and dispersed approach – as is the case at the moment – or to consider quicker and more localised approaches – to 'task heating'.

In considering potential interventions, we started by analysing conventional approaches to generation, delivery and retention, and divided these between technological or management interventions. Less conventionally, we added another layer to the categorisation – symbolism. This was orientated towards the pedagogical desire for the Abbey to display its carbon reduction credentials but it could also, in our view, offer new opportunities for adding architectural value and new opportunities for ceremonial practices.

We then made a number of proposals concerning heat generation, delivery and retention. It wasn't our brief to propose a definitive solution but inevitably we had our favoured approaches and sense of an overall strategy. The best approach to generation seemed to be a wood pellet boiler, not least because of Hexham's location near the vast man-made forests of the Kielder area. In relation to the delivery of heat, the existing heating system is complex. The surface area of heating pipes is greater than the surface area of radiator, meaning that the pipes are doing more heating work than the radiators. Much of this pipework is at high level in the triforium, placed well above the congregation, and therefore losing heat out of the un-insulated roof. We felt that heat should instead be delivered through under-floor heating pipes (accepting that there is some very sensitive archaeology to consider). We also recommended localised short-term ('task') heating that could be introduced in various ways including heated kneelers. In terms of the retention of heat, a good deal could be achieved by insulating the roof. However, the substantial slate roof has been replaced relatively recently so we reasoned that this work should wait another 30 or 40 years until the next scheduled replacement of the roof slates. Another possibility for heat retention considered was the possibility of introducing window shutters or curtains, with the 'curtain cranes' designed in the nineteenth century by AWN Pugin in mind. The idea here would be to introduce something less intrusive than secondary glazing which could use exquisitely patterned fabrics (if curtains) or expert carpentry (if shutters) to add a positive adornment to the church. Opening and shutting of the curtains or shutters could be a processional and ceremonial moment at the start and end of every Abbey day.

Physical changes to the building were only part of our suggested solution though. We also proposed changes to social expectations. We recommended the promotion and acceptance of a colder abbey, maintaining a lower ambient temperature to reduce the amount of heating required. This acknowledged that the widespread expectation of a constant internal temperature in buildings, whatever the external temperature, has only come about in the last 40 years, while also recognising that the congregation would be unlikely to accept the idea of turning the heating off entirely. Any transition would need to be carefully handled and introduced gradually so that the organ and other building fabric could 'learn' a new colder temperature. This proposal for a lower ambient temperature gave rise to one of our favourite ideas, and one that caught the imagination of many of our consultees: the 'Hexham Habit'. This is a very simple idea of lending visitors a fleecy cloak like a cassock – ideally a beautifully crafted garment – to keep them warm during their stay in the Abbey.

It is noticeable that our preferred 'symbolic gestures' were mostly about retaining energy (the ceremony of curtains or shutters) or about accepting a colder building and dressing accordingly (the Hexham Habit) or perhaps providing some small-scale temporary local heat sources (the kneelers). But, in the consultation we undertook, at least some of our consultees focused upon another symbolic gesture – the introduction of photovoltaic cells on roof slopes. We had largely discounted photovoltaics as having a significant role to play, because our estimates suggested that they could only generate a limited amount of the electricity the Abbey uses, which in turn is the minor part of its carbon consumption. Despite having these conversations, photovoltaics remained appealing to some in the parish. In part, this may have been because they were seen as a 'quick win' – our proposals would take longer to work through – and solar generation could also benefit from government financial incentives. But, in part, it seems to have been about wanting to achieve a visible gesture of intent, to be seen to be setting an example for the wider community.

In summary, then, our preferred interventions at Hexham were based upon changing some management practices, introducing a few new elements into the building that could hopefully be celebrated as positive visual additions, generating heat more sustainability and having only minimal impact on the fabric. In making our proposals, we were confronted by a series of complex, interlocking and contingent questions which had implications not just for the building fabric but also for its management and for social expectations of its thermal performance and appearance. Our decisions attempted a distinctive reconciliation of visual and thermal properties, preferring to find creative opportunities afforded by low carbon priorities to propose characterful changes to the building which drew from its particular spirit and traditions (curtain cranes, heated kneelers, Hexham Habits etc.). We recognised that few changes would be instant 'quick fixes' but rather that they would require a longer term strategy to implement over time. We learnt from the consultation that symbolic value – being seen to do something, to make a contribution to sustainability, imagined in terms of community leadership – remains important even where the actual quantified contribution of more visible technologies may be less than the contribution of those more invisible technologies. The consultation also suggested that achieving physical changes to a building may be easier than achieving changes in people's expectations and habits (even when fleecy habits are on hand as mitigation).

Discussion

The process of making a historic building more carbon-efficient involves a complex series of technical, regulatory and social factors interacting with issues of heritage value. Many

different strategies are generally possible in principle, but it seems likely that to be successful they will need to be technically well considered, meet regulatory compliance standards (in terms of impact on heritage as well as energy consumption) and be successfully adopted in terms of use. For example, an improvement in efficiency, through say a technological intervention, might be neutralised by changing social behaviour, such as rising thermal comfort levels.

Technical interventions are likely to involve physical works to reduce energy consumption or to encompass micro-generation. They might also require changes to management practices and the way that a building is used. Physical works in turn, if permitted, might have an influence on the historic fabric of the building or on an aesthetic reading of the building. The extent to which heritage values accommodate the push for carbon-neutrality might dictate which strategy is used in practice. No shifts in heritage value might seriously limit the work undertaken. Asserting carbon goals as an overriding imperative might mean the retention of a building (given the embodied energy it represents) but imply significant change to its fabric and aesthetic appearance. Whilst carbon values are important, we would argue that so are heritage values and aesthetic considerations.

A further factor we need to consider is the symbolism of the carbon-reduction agenda. Much of the literature on carbon control and social practice has focused upon explaining the apparently irrational non-adoption of carbon mitigation measures despite, for example, the fiscal incentives that exist. However, it is evident to us that equally there are some people for whom the importance for introducing technology associated with carbon reduction can extend beyond the techno-rational case. The case studies presented briefly here have illustrated how powerful this can be. The photovoltaic cell in particular seems to have become a potent symbol of green credentials. This was evident in our discussions with stakeholders at Hexham Abbey some of whom wanted a clear visual symbol of intent, despite PV cells not being technically the most effective, or 'greenest', way forward.

The planning system is the arena in which conflicts of value are often resolved. Much of the time planning policy frameworks present heritage protection and carbon control as equally important objectives, with little indication how to resolve their competing claims, other than through the discretion of the decision-maker. From the limited evidence we have, we suspect that, for professional planners, the special circumstances of heritage designation, and the assumed values of associated with this, can militate against carbon reduction measures that would be considered acceptable in other contexts. Equally, it seems to us, there can be public sentiment or political support for the symbolism of carbon-control that outweighs the established conservation outlook on the historic environment. Either way, it often seems to be a case of deciding between either heritage protection or carbon-reduction.

However, the potential conflicts between heritage values and carbon-reduction values can offer creative architectural opportunities. Historic buildings have their own individual distinctive characters and practices. As we argued at Hexham, a building's distinctive spirit can be imagined as an opportunity for finding locally specific approaches to carbon-reduction rather than always simply bolting-on 'off-the-peg' technologies designed primarily for new build. While there may be associated financial costs, there are also opportunities for the responsible, creative re-imagination of historic spaces in the spirit of Morris' SPAB Manifesto. Thus, in our work at Hexham, we sought a different position from the binary of heritage values or carbon reduction. We pursued an architecturally creative approach, which entailed some shift in heritage value. On the premise that aesthetic readings of buildings are

more volatile and short-term than the emphasis on historic fabric, we envisaged a situation which would accept and indeed celebrate new aesthetic readings of buildings whilst continuing to emphasise the importance of fabric in what makes historic buildings significant. We would like to think that some of the measures we proposed as possibilities at Hexham fit this approach better than the standard photovoltaic cell. But, equally, should we really worry about such visible technologies in most circumstances? They are eminently reversible and, even if introduced *en masse*, are likely to become, over time, either as 'invisible' as television aerials or as transient as satellite dishes. As we have seen, heritage and conservation values change over time. The 'shock of the new' becomes tomorrow's heritage. Why we need heritage, what it is, and how we conserve it, remains in constant negotiation, with some elements of change quick and some slow. As part of this on-going iterative process, we need to think about how we can come to love the heritage of carbon neutrality.

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Figures

Figure 1 Photovoltaic cells on the roof of a new house in the rural village of Netherwitton, Northumberland

Figures 2 – x Hexham Abbey……